

What is claimed is:

1 1. An apparatus for manufacturing at least one biochip
2 from at least one substrate comprising:

3 a conveying device for moving the substrate through a
4 series of receiving positions; and

5 a series of dispensers positioned at a series of
6 dispensing positions relative to the series of receiving
7 positions of the conveying device, wherein each of the
8 dispensers has a plurality of nozzles, and each of the nozzles
9 dispenses a predetermined reagent at a predetermined position
10 of the substrate;

11 wherein each dispenser in the series of dispensers
12 dispenses an array of reagents onto the substrate when the
13 substrate is positioned in the corresponding receiving
14 position.

1 2. The apparatus as claimed in claim 1, wherein the
2 dispensers are separated by a predetermined distance along
3 a first axis defined by the motion of the substrate, and the
4 conveying device moves the substrate the predetermined
5 distance in a step-by-step manner.

1 3. The apparatus as claimed in claim 2, wherein the
2 series of dispensers are aligned such that the reagents,
3 dispensing from different dispensers, do not overlap.

1 4. The apparatus as claimed in claim 3, wherein the
2 conveying device comprises:
3 a base for receiving and supporting the substrate ; and
4 a plurality of transferring devices, disposed at the
5 base, for moving the substrate from one of the series of
6 dispensing positions to the next in the series of dispensing
7 positions.

1 5. The apparatus as claimed in claim 4, wherein the
2 conveying device further comprises:

3 a plurality of positioning devices, disposed on the base,
4 corresponding to the series of dispensing positions; and

5 a plurality of retainers, disposed on the base,
6 corresponding to the plurality of positioning devices;

7 wherein each of the positioning devices pushes the
8 substrate into a predetermined position corresponding to
9 dispensing position and the retainers hold the substrate in
10 the predetermined position.

1 6. The apparatus as claimed in claim 5, wherein the base
2 is provided with a slot, and each of the transferring devices
3 comprises:

4 a cam rotatably disposed at the base; and

5 a rod extending through the slot for moving the substrate,
6 wherein the rod is connected to the cam at one end, and abuts
7 the substrate at the other end, wherein the rod moves the
8 substrate by the rotation of the cam.

1 7. The apparatus as claimed in claim 3, wherein the
2 conveying device comprises:

3 a plurality of fixtures for receiving and supporting the
4 substrate;

5 a base for disposing the fixtures thereupon; and

6 a plurality of transferring devices, disposed at the
7 base, for moving the fixture from one of the series of
8 dispensing positions to the next in the series of dispensing
9 positions.

1 8. The apparatus as claimed in claim 7, wherein the
2 conveying device further comprises:

3 a plurality of positioning devices, disposed on the base,

corresponding to the series of dispensing positions; and
a plurality of retainers, disposed on the base,
corresponding to the plurality of positioning devices;
wherein each of the positioning devices pushes the
fixture into a predetermined position corresponding to
dispensing position and the retainers hold the fixture in the
predetermined position.

9. The apparatus as claimed in claim 8, wherein the base
is provided with a slot, and each of the transferring devices
comprises:

a cam rotatably disposed at the base; and
a rod extending through the slot for moving the fixture,
wherein the rod is connected to the cam at one end, and abuts
the fixture at the other end, wherein the rod moves the fixture
by the rotation of the cam.

10. The apparatus as claimed in claim 3, further
comprising:

a step motor, electrically connected to the conveying
device, for moving the conveying device the predetermined
distance; and

at least one sensor, for detecting the position of the
substrate, electrically connected to the step motor, whereby
the movement of the substrate, moving along with the conveying
device, depends on the detection of the sensor.

11. The apparatus as claimed in claim 10, wherein the
conveying device comprises:

a conveying belt for receiving and supporting the
substrate thereupon; and

two rollers, electrically connected to the step motor,
for moving the conveying belt.

1 12. The apparatus as claimed in claim 11, wherein the
2 dispensers are divided into plural groups at the
3 predetermined distance in the first axis, and each group of
4 the dispensers moves in a second axis perpendicular to the
5 first axis.

1 13. The apparatus as claimed in claim 10, wherein the
2 conveying device comprises:

3 a rotor electrically connected to the step motor; and
4 a platform, disposed on the rotor, for the substrate
5 disposing thereupon.

1 14. The apparatus as claimed in claim 13, wherein the
2 platform is circular shape, and the dispensers are disposed
3 in a ring.

1 15. A method for manufacturing at least one biochip from
2 at least one substrate comprising the steps of:

3 receiving the substrate on a conveying device;
4 conveying the substrate through a series of receiving
5 positions corresponding to a series of dispensing positions;
6 and

7 dispensing a series of arrays of reagents onto the
8 substrate at each dispensing position.

1 16. The method as claimed in claim 15, wherein the series
2 of receiving positions are linearly arranged.

1 17. The method as claimed in claim 15, wherein the series
2 of receiving positions are arranged in a ring.

1 18. The method as claimed in claim 15, wherein the series
2 of arrays is non-overlapping.

1 19. The method as claimed in claim 15, wherein a
2 plurality of substrates are received onto the conveying
3 device simultaneously, each of the plurality of substrates
4 being conveyed through the series of receiving positions is
5 a step-by-step manner.

1 20. A method for manufacturing at least one biochip from
2 at least one substrate comprising the steps of:
3 receiving the substrate on a conveying device;
4 conveying the substrate through a series of receiving
5 positions corresponding to a series of forming positions; and
6 forming a series of arrays of reagents onto the substrate
7 at each forming position.

1 21. The method as claimed in claim 20, wherein the series
2 of receiving positions are linearly arranged.

1 22. The method as claimed in claim 20, wherein the series
2 of receiving positions are arranged in a ring.

1 23. The method as claimed in claim 20, wherein the series
2 of arrays is non-overlapping.

1 24. The method as claimed in claim 20, wherein a
2 plurality of substrates are received onto the conveying
3 device simultaneously, each of the plurality of substrates
4 being conveyed through the series of receiving positions is
5 a step-by-step manner.